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ABSTRACT

This guide contains suggestions designed to guide educators in their efforts to produce competency-based instructional units. Discussed first are the nature of competency-based instruction and the need for materials. The next section deals with such administrative procedures as establishment of ownership of the materials, follow-through, credit for prior knowledge, and adaptation of publishing materials. The third section lists 25 questions to be asked and answered by the educator before writing instructional units. Covered in the next section are the following aspects of instructional development: writing content, performance objectives, subunits, self-evaluation activities, and pre- and posttests; confirming proficiency; evaluating instruction; writing at specified reading levels; promoting success; and maintaining instructional content standards. The next section outlines procedures for developing the format of instructional materials, including artwork, graphics, and production. Recordkeeping and instructional management are discussed in the sixth section. Concluding the guide is a pre-and posttest key. (MN)

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Professional
Development
Series, no. 4

DEVELOPING YOUR OWN INSTRUCTIONAL UNITS

Merle Wood

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ABOUT THE AUTHOR

Merle Wood has been active in the field of curriculum development, producing instructional units on a variety of business education topics. He has served as a curriculum consultant to numerous school districts, publishers, national associations and businesses.

Mr. Wood has conducted workshops for business ed. teachers at colleges and universities, and he has taught business education in high schools for 10 years. His five years as a supervisor of business education with the Des Moines Public Schools won him a merit award for exemplary service from the city school system.

Mr. Wood is currently working as a specialist in business education for the Oakland, California Public Schools.

The author wishes to acknowledge direct or implied reference made in this publication to his previous work, which has appeared in the *California Business Education Journal, Technical Education News* and *The Balance Sheet.*

Editor: Vicky Lytle Hula

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INTRODUCTION

This publication is designed for vocational educators who have turned to their typewriters, drawing boards and duplicating equipment in hopes of producing high quality instructional materials. The suggestions in this booklet are meant to guide educators in their efforts to produce competency-based instructional units.

The need for such a publication is due in part to the fact that commercial publishers have been hard pressed to keep up with the rapid growth and expansion in the field of vocational education. In responding to emerging occupational needs, vocational educators have assumed responsibility for developing instructional units in fields where resources for instruction are limited or nonexistent.

Instructional units for vocational education programs have been developed in a variety of settings: state departments of education and designated curriculum labs, vocational institutions, universities and consortia. The products developed by these institutions vary greatly in quality. While some institutions have allocated considerable time and money for developing professional curricula, others have not had a lot of resources to devote.

It is hoped that this booklet will aid those institutions with limited resources and experience in the production of instructional units. Not all of the strategies outlined may work in your institution. You should feel free to adapt these recommendations to work for you. By following the general approaches described on these pages, the beginning instructional developer should be able to produce modular instructional units that are motivational, attractive and instructionally sound.

Part I
THE CLIMATE FOR CHANGE

Our communities and school patrons are insisting that public schools become accountable. They are insisting that we as educators meet the educational needs of students—of all students—and that we get on to that task immediately. A vast majority of the states, for example, have passed some sort of legislation requiring students to reach a certain level of proficiency in basic skills before they can be granted a high school diploma by a local school district. Communities can no longer accept the graduation of large numbers who cannot spell, read, write or do basic arithmetic.

Although schools have many justifiable defenses to explain their failures, these arguments have not stilled public concern. Schools are dealing with a cost-conscious public today. Various tax reform initiatives, such as California's Proposition 13, are being considered by other states. As parents press for the best possible learning for their children, support for the voucher system has grown. Such a system would force public schools to compete directly with private and parochial schools, since students would be allowed to spend their state-issued vouchers at the institution of their choice.

Moreover, learning specialists continue to question why public schools insist on teaching students the same way for the same amount of time when it's known that students have differing personalities, needs and motivation.

Educators have been guided by traditions that in many cases have been hard to change. In secondary schools we have been wedded to the Carnegie unit: one hour of instruction per day for one year. The basic system has been to instruct students with lecture and demonstration techniques for an hour a day—whether the student needs it or not. There has been too little attention given either to the superior student or the slow learner.

Moving against tradition in our schools is usually difficult. Finding a way to implement flexible, individualized competency-based instruction has not been easy. However, since it is particularly suited to the development of skill in vocational fields, it has always been a part of vocational education. Private business and the military have also been using this style of instruction for years.

Now, with the insistence that there be more efficiency in public education coupled with a demand for accountability, competency-based instruction in the public schools is finding a climate where it can be used more widely. Thus, it is no surprise to find vocational educators involved in refining the procedures in order to fully institute this form of instruction.

WHAT IS COMPETENCY-BASED INSTRUCTION?

Competency-based instruction is a teaching methodology that develops students' knowledge, skills and attitudes toward a stated goal. The emphasis is on demonstrated competency, and every exercise, objective and activity is aimed at developing that competency. The curriculum is sequenced, accordingly, into small, manageable units or modules. Progressing through

these units, students demonstrate their competency—or their ability to meet specific, stated performance objectives—on each module.

With its emphasis on student mastery of material, competency-based instruction may be individualized. Students can be made aware of the broad goals of a vocational program and work on their own to meet specific performance objectives within it. They can see their own progress, recognize their proficiency and identify areas where they need additional training. The modular design permits students to progress through the many small segments of the program at their own pace.

If students are absent or choose to drop out, they can "drop back in." Modularized credit encourages students to do each program segment because, as they complete a unit, they immediately gain a fractional unit of credit.

Another compelling feature of most modularized instructional units is the use of pretests and post-tests. The most important value of the pretest is to let both the instructor and student know how proficient the student is (or is not) before he or she spends time working and studying through the unit. Students who score to a predetermined high level on the pretest are given credit, skip the unit and go on to the next unit of instruction.

The Arguments For It

One of the major benefits of competency-based instruction is the psychological value it provides to students. They know exactly what they are to be able to do when they complete a unit and what is an acceptable level of accomplishment. They know that they have learned a required skill or knowledge and this is a rewarding, fulfilling experience.

The instructor knows exactly at which point each student is in the instructional program. Some students will have forged ahead on an individualized basis. Some will need special help from the teacher or aide to reach various objectives. All of the ambiguity associated with a letter grade is gone. Students are certified competent in each instructional unit on the basis of their ability to perform required skills. It's clear to both the instructor and the student whether the student is learning and progressing.

The community also benefits from competency-based instruction. An instructor will certify only those students who are competent on the various units in the training program. If students do not progress, there must be a reason: supplies for instruction were not on hand, necessary equipment was unrepaired or unavailable, the student was seldom in class or some other identifiable reason.

Arguments Against It

Some persons express the feeling that using pretests, individualized instruction units and post-tests is a rigid system of instruction. They claim that it encourages instructors to teach directly to the test. They are correct. It is for this reason that most individualized instruction programs maintain small-group and large-group activities and instruction. Every bit of content does not need to be delivered on an individualized basis. Indeed, the instruction is too rigid if this procedure is followed too faithfully.

It is also correct that this kind of instruction does teach to the test. If the post-test is carefully prepared and representative of the important points in the unit of instruction, we should make no apologies to teaching to the test. Most teachers, regardless of the methodology they use in instruction, are trying to get students to learn. Certainly one objective is to get them to pass the final examination. This is as true when individualized units are used in teaching as it is when lecture and demonstration methods, are employed.

THE NEED FOR MATERIALS

One of the major problems that schools face as they implement competency-based instruction is the lack of individualized materials that meet all of the criteria required for its use. Some schools have designed, developed and produced their own individualized units. Yet, in many cases, these materials have not been well designed educationally, philosophically, psychologically or physically. Some do not teach anything: they are simply full of drills and exercises. Others are unattractive and difficult for students to use.

At the same time, there has been a growing dissatisfaction on the part of teachers over the materials that are available from many publishers of commercial texts. The content of many such texts continues, as in the past, to be excellent. However, the format, structure and system of traditionally designed materials are not meeting the needs of schools or students. In spite of the expressed concerns of many school personnel, too few publishers have altered the system and structure of their materials to meet the special needs of today's schools and students.

While there are more modular materials now being produced by commercial publishers, they cannot be expected to meet the needs of all vocational teachers within the forseeable future. Whenever a school is able to purchase commercial units it should do so. Most educators cannot compete with the quality of commercially designed instructional materials. Unless a district is able to use its staff writers at no charge, educators cannot compete with what sometimes seems to be a high cost for commercial instructional modules. The motto should be, "Unless you *must* develop an instructional unit locally, *don't*."

Part II
NECESSARY ADMINISTRATIVE PROCEDURES

Classroom teachers should not attempt to develop competency-based instructional units without involving and gaining the support of school administrators. Several administrative issues must be resolved and staff and resources should be assigned before any developmental work can begin.

At the outset, it must be determined who will be responsible for writing, producing and designing the units and who will be given credit for the materials developed. Basic production decisions should be made at this stage, including how many copies will need to be printed, how copies will be duplicated and whether funds are available for illustrating materials. Administrative approval must be gained for any special instructional techniques, such as whether students will be given credit for a unit if they pass a pretest.

ESTABLISHING OWNERSHIP

Before work gets underway, a decision needs to be made on how the institutional credits will appear on the title page. The name of the institution will, of course, appear. But how about a department name? If one of the writers is from an unrelated department, will that department receive credit in the institutional statement? Such disputes, since they deal with "turf," do occur. Will the writers have a by-line? If not, the decisions should be made before writers begin to write—not after.

Who "owns" the materials? If materials are developed on a writer's own personal time it is not uncommon to recognize personal rights of ownership. If they are developed on staff time the decision often is to copyright them in the name of the institution. If writers are to be paid, how will the rate be determined: on an hourly basis or on a piece-rate basis?

All writers, whether they are paid or not, whether they are working on materials individually or as a part of their paid job, should be required to sign a statement saying that the material they produce will be absolutely free from copyright violation. There are hundreds of materials that have been produced and used within an institution with portions of text that have been copied wholesale from copyrighted, commercial materials. No institution wants to face embarrassment (and possible legal problems) because of copyright infringement. The responsibility for assuring that the copy produced is original work lies with the writers. But administrators should see to it that there is a written, signed statement verifying that the material is free from violations.

It should also be decided early on who may use the materials produced. Too frequently a team develops a series of units only to find that someone or some department within the district has secured a master copy, produced quantities of the units and used them at inappropriate levels and in inappropriate ways.

THE FOLLOW-THROUGH

Those in charge of the development of the materials should be in a position to assure the writing and production team that the materials will be reproduced according to the team's recommended standards. It is not rare for a writing team to produce a unit and find that there are no funds to reproduce it. Frequently writers include special instructions in their manuscripts that later are not carried out. For example, if students are directed to "turn to the pink pages at the back of the packet," then it is important that the pink pages be there—not white pages or green pages.

Writers who develop their copy for reproduction on both sides of the pages sometimes find that it was reproduced with print only on one side. It is difficult to prepare paged copy for back-to-back printing and there generally is a purpose in doing so. Failure to produce the materials faithfully as they were designed to be produced leads to students' confusion. This in turn frequently results in less effective learning.

Finally, there must be assurance that the materials will be produced in sufficient quantity to meet classroom needs. An inventory system should be established and, when supply of various units reaches a specified point, the classroom stock needs to be replenished. Flexible, modular and individualized programs are designed for efficiency in instruction. There is no efficiency when students have to wait for several days or weeks for the duplicating department to produce needed instructional materials.

CREDIT FOR PRIOR KNOWLEDGE

Another administrative decision that should be made before writing begins is whether to allow students credit for knowledge gained before taking a course. A system should be developed to enable students to receive a fractional unit of credit by successfully challenging, or in other words, passing the pretest of an instructional unit. Since the entire emphasis of competency-based, instruction is on demonstrated competency, it is difficult to defend forcing students to take a unit of instruction when they can demonstrate, through the pretest, that they are already competent on the content.

Some schools, in order to assure that there is no question about competency, have students take an alternate post-test as well. This gives added assurance that they are competent. This competency should be immediately rewarded by granting students the appropriate credit for the unit of instruction and having them move on to the next unit.

ADAPTING PUBLISHED MATERIALS

As we have stressed from the start, it is simply not cost-effective to develop instructional units locally when there are materials already developed that could be used. Before initiating work on any instructional units, you should make certain not only that there are no commercial publications, but there are no instructional materials developed by other schools that would fit your needs.

You can find out about locally developed materials from throughout the country through your state liaison to the National Network for Curriculum Coordination. Your state division of vocational education should be able to put you in touch with this person, who works with your regional coordinating center to determine whether locally developed curriculum can be found on a given topic.

Your search may turn up traditional texts that contain the materials you want but are not in a modular form. If this is the case, you may be able to adapt such texts without too much difficulty. Go through the text and mark the units your students are to cover. For example, you may find that Chapters 1, 2, 3, 4, 5, 8, 9, 12 and 16 provide the content that you want your students to cover. Use the methods outlined in this publication to develop pretests and post-tests for each unit. If there are portions of information you wish to add to the text chapters, prepare only that instruction yourself and direct students to study it along with the chapters.

Part III
BEFORE WRITING INSTRUCTIONAL UNITS

Those who are considering writing instructional units should ask (and answer) the following questions before designing and writing the units:

1. Is the unit really needed?
2. How will the unit fit into the total instructional program?
3. Which students will use the unit?
4. Where did instruction prior to the unit leave the students?
5. What are the basic skills of the students who will use the unit?
6. What assumptions are you making regarding students' basic competency?
7. What will the students be expected to accomplish by using the unit?
8. What will be the next step for the students after completing the unit?
9. How long (or short) do you expect the unit to be?
10. What is the central theme of the unit you are planning?
11. What are the specific performance/attitudinal objectives of the unit?
12. How can you state the objectives so they are clear to the students?
13. How will you convey to students the significance of this unit?
14. Will there be a pretest and post-test for this unit?
15. Will you permit a student to skip the unit based on high pretest performance?
16. How can you provide for instructional options within the unit—places where students can choose from several learning activities?
17. How can you make the unit activity-oriented—so that students are doing something?
18. How can you make the unit attractive and interesting?
19. How can you provide for students to assess themselves?
20. How will you evaluate student performance on the unit?
21. How will you make it obvious to students that the content of the unit is relevant to them?
22. How can you orient the materials so that students will succeed with them?
23. How will you provide a system so that each student has the time he or she needs to complete the unit?
24. How will you provide for extra or bonus activities for selected students?
25. What kind of management system will you develop for administration of the unit?

Once these questions have been answered, the writer can begin to think of the actual preparation of the unit.

Part IV
DEVELOPING THE INSTRUCTION

Decisions that are made on how the instructional units will be developed are critical ones. The success of any instructional unit depends, after all, on how efficiently teachers can manage the instruction and how easily students can learn from it.

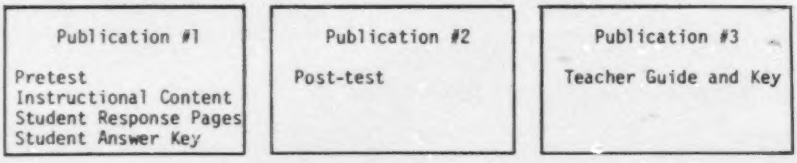
The major components that make up many instructional units are as follows:

- Instructional content
- Student response pages
- Student answer key
- Pretest/post-test
- Teacher guide and key

At the minimum, at least three separate items must be produced for an instructional unit. The first would contain the pretest, instructional content, the student response pages and the student answer key. The post-test will naturally have to be a separate product, as will the teacher guide and key.

The fewer parts there are to the system, the easier it will be to manage. For example, if there are 40 modules to an instructional program, and if each module has six separate and distinct parts, there will be 240 separate publications to produce, duplicate, stock and handle. While there are many defenses for alternative production designs, the number of separate publications should be kept as small as possible.

PROFILE OF AN INSTRUCTIONAL MODULE



THE CONTENT

Once a tentative decision has been made to write an individualized instructional unit it is necessary to prepare, in writing, a goal statement. This statement will become the focus of the writing activity. It will be somewhat broad to reflect the intended educational value of the unit, rather than a statement of its impact or value to the student. A few examples are:

". . . to develop skill in the manual verification of clerical data."

". . . to develop an understanding of the principles of operation of a four-cycle engine."

". . . to develop skill in the operation of a band saw."

". . . to explain the development of the labor movement in the United States."

Such goal statements tell what the instructional *unit* is intended to do—not what the *student* will do. In order to meet some particular goal statement, it may be necessary to break the objective into small segments. Each segment will be written into a separate instructional unit. The segments, sometimes six or more, will have the same general goal statement. However, the *objectives* of each of the units will be very specific, and they will be prepared in performance-based terminology.

PREPARING PERFORMANCE OBJECTIVES

Performance objectives (sometimes called competency-based statements) are merely statements that describe what the student will be able to do upon completion of the unit. They tell the conditions under which the student is to perform and the level of performance that will be acceptable. For instance:

Given 15 minutes time and 40 source documents, each with a five-digit document number, the student will be able to compare the document numbers against a listing of the numbers and verify with 100 percent accuracy that both sets of numbers are correct.

This statement is very specific. It tells exactly what the student is to be able to do at the completion of the unit. It lists the conditions under which the student is to function, and it lists the level of proficiency that must be demonstated.

IDENTIFYING THE SUB-UNITS

Within any unit there will be sub-units or recognizable independent sections. Identify each sub-unit and give it a sequential number or letter. For example, a unit titled "Sorting, Checking and Verifying Data" might be broken down into the following mini-units:

1. What you will learn (objectives)
2. Why you need to have this skill (rationale)
3. Planning for your work
4. Using business forms
5. Using a sales check
6. Completing a sales check
7. Organizing your working papers
8. Sorting and copying data
9. Verifying math
10. Arranging papers
11. Selecting and verifying data
12. Searching for answers on source documents
13. Using a summary page
14. Finding and correcting errors
15. Locating required data from summary pages.

Call the first of these sub-units "Step One," "Unit One," "Job One," "Task One," "Phase One"—or something that will identify it sequentially. Number each succeeding sub-unit throughout the unit. Such a numbering system lets students know which segment they are working on. It helps them

to see progress, as they complete job 7, they realize that they are almost halfway finished with the 15 sections of the job unit.

This sub-unit identification system also is very valuable when students evaluate their progress. After each sub-unit there can be a question or two, a brief exercise or some sort of activity where they can perform and, with a bit of guidance in the unit, evaluate their own work. This technique does give them the feeling of accomplishment which, in traditional instruction, is provided by the teacher.

Make the sub-units small. Make them meaningful. Be sure to tell students in the sub-unit instructions what they are about to do. The task may be as simple as writing a check. Identify it as "Job One." Title it, "You write a check." Give them directions and instructions. Let them perform as often as possible by responding to questions, by using theory they have learned, by identifying vocabulary terms or some other activity.

GETTING STARTED

You will do 12 jobs in this unit. Each one will help you to develop skill in sorting, checking, and verifying information. You will be working as a clerk for Oakland Enterprises, a wholesale plumbing supply company.

Do each of the job assignments carefully. Read directions and follow them. After completing each job check your work. Then turn back to this page and fill in the Self-Rating record. There is an answer key in the back of this unit. You can use it to check each job. Always do the jobs yourself, then check with the answer key. If you make any mistakes, correct them. You should, however, try to figure out why you made the error. Your teacher can help you with this.

USING THE SELF-EVALUATION RATING SCALE

After you do each job and check it with the answer key, you are to evaluate your work. You decide if you did a Poor, Fair, Good, or Excellent job. Please note: Most of your evaluations will be either Good or Excellent. This is what you hope for and what your teacher expects and wants. The jobs are not hard. They can be tricky enough though if you do not work carefully. The jobs are designed so you can do them and and do them well.

JOB NUMBER	POOR	FAIR	GOOD	EXCELLENT
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

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SELF-EVALUATION

Somewhere in the unit have a system by which students can at least "check off" jobs they have completed.

You may, depending upon the objective and content of the unit, be able to present a scale on which they can evaluate their work. It may be as simple as "Poor, Fair, Good, Excellent" but it will give them the opportunity to look over the quality of the work they have done and, if it is a well-designed, success-oriented unit, they will see and know that they are learning.

DEVELOPING THE PRETEST AND POST-TEST

The pretest is developed for student use prior to the time he or she begins the instructional unit. It serves to inventory just how much the student does or does not know. Generally, if a student scores to a sufficiently high level on the pretest he or she is granted credit for the unit and progresses to the next unit without delay.

The easiest way to develop the pretest is to draw the questions and exercises from the objectives of the completed unit. In other words, after you have completed writing a unit, go through it and compose the pretest. Many writers use true-false, multiple choice and completion-type questions in the pretest. Others use performance tests. For example, if the unit covered the procedures used in adjusting an automobile carburetor, the pretest might have a student actually adjust a real carburetor rather than answer questions on the theory behind it. The same kind of activity test can be conducted as a post-test.

There are many subjects and programs that lend themselves to having students tested on real procedures rather than taking written tests. If the unit covers change-making, the student can be given actual change-making problems and simulated coins and bills. The student can be scored on his or her ability to actually make change rapidly and accurately. The same is true with operating a cash register, preparing a balance sheet, squaring a board or baking a cake.

When written tests are prepared they should cover the unit's objectives and the real theory that is taught within the instructional unit. A true-false question such as "Is it important to have an automobile carburetor properly adjusted?" is really no question at all. It is obviously true. However, a statement such as "The openings between the idle passage and the carburetor barrel are called transfer ports." can only be answered by a student who is familiar with the workings of the carburetor. This kind of question can indicate a student's competency or lack of competency.

CONFIRMATION OF PROFICIENCY

The same test that is given as the pretest should also be given as a post-test. Since this is the same test, students and teachers can measure real growth in knowledge and skill. Many students find that on the pretest they missed, for example, 20 questions out of 25. At the conclusion of their study they take the same test again, this time as a post-test. The student who missed 20

questions the first time (pretest) may now miss only three or four questions—or fewer. It is obvious to the student, the teacher and anyone else who is interested, that the student *did* learn. Such growth is common in individualized, modular instruction programs.

After the students take the pretest or post-test, the instructor collects it, scores it, files it and tells students their scores. Records of pretest/post-test performance are valuable to the school administration if there is any question about teacher competency. Further, a teacher who is challenged can simply invite the challenger to administer post-tests to the students. Since these students already are proven to be proficient, the challenger will only confirm the students' competency. (This is true accountability.)

It generally is wise to develop an alternate post-test for all instructional units. In cases where students pass the regular pretest at a high level you may administer the alternate post-test. Should they pass this examination with the same high degree of performance there should be no question about their competency. When students pass two such tests over a unit of instruction the school should have no problem about certifying their competency and issuing them credit for such units. This alternate post-test also will be useful when students who, after studying the unit, take the regular post-test and fail it. After additional study within the unit, or some form of remedial instruction, they will be ready for another post-test. The alternate post-test should be used.

A SAMPLE PRETEST/POST-TEST

As an example, a pretest/post-test has been developed for the contents of this booklet. Review the test to get an idea of how one may be structured. You may even want to take it as a post-test when you finish reading this booklet. The answer strip for the pretest can be torn off and the same questions, this time with the post-test answer strip attached, can be used for the post-test.

This test can also be used as part of the staff development program in your school or district. Teachers who do not score above a certain level can go through this booklet in small groups or individually. If you are a teacher educator, you can use this test with your students.

Name _____ Date _____

DEVELOPMENT OF INSTRUCTIONAL UNITS
PRETEST/POST-TEST

You will take this same test twice, once at the start of this unit and once at the end. Read each statement. Decide if the statement is true (T) or false (F). Circle the T or F in the left margin. If you do not know, circle the D.

When you take the post-test, fold back the answers to the pretest.

	POST-TEST (Name)			PRETEST (Name)		
1. Most of today's locally developed, noncommercial instructional units are of good quality and can be used very effectively in the classroom.	T	F	D	T	F	D
2. Because they are difficult to develop and they do use space, illustrations and graphics in locally produced materials should be kept to a minimum.	T	F	D	T	F	D
3. Locally developed instructional materials are best broken into small, sequential units, each appearing as a separate booklet or packet.	T	F	D	T	F	D
4. Business, industry and the military have been using competency based, individualized instruction methodology for many years.	T	F	D	T	F	D
5. There is no quick, simple way to evaluate the reading level of instructional materials.	T	F	D	T	F	D
6. Lowering the reading level of materials you might prepare is a complex, time-consuming task.	T	F	D	T	F	D
7. The primary reason for today's interest in modular, individualized instruction is the recent discovery that it is an effective teaching method.	T	F	D	T	F	D
8. Within each instructional unit there should be subunits of content.	T	F	D	T	F	D
9. Because they are expensive, consumable instructional materials should be avoided.	T	F	D	T	F	D
10. Providing a system for students to evaluate their own progress within instructional units is of very limited value.	T	F	D	T	F	D
11. Vocational educators have used many elements of competency-based instruction for many years.	T	F	D	T	F	D
12. Only on rare occasions can one defend the inclusion of an answer key in the instructional unit.	T	F	D	T	F	D
13. Using individualized instructional modules that are written to specific objectives tends to produce a relatively rigid system of instruction.	T	F	D	T	F	D
14. High quality pretests and post-tests are extremely difficult to develop.	T	F	D	T	F	D
15. A redundant post-test (exactly the same as the pretest) should be used only in rare cases.	T	F	D	T	F	D

16. At least one version of an alternate post-test should be developed for each instructional module.	T F D	T F D
17. Students should be permitted to "test out" of a unit of instruction by demonstrating that they already are competent.	T F D	T F D
18. The primary reason for using locally developed instructional units is to avoid the cost of buying commercial materials.	T F D	T F D
19. There is a growing supply of commercial materials that are designed modularly and, therefore, can be used in a flexible instructional setting.	T F D	T F D
20. Modular credit (granting fractions of units of credit) is an integral part of competency-based instruction and modularized instructional materials.	T F D	T F D
21. Modular materials are particularly effective for use in competency-based instructional programs.	T F D	T F D
22. It is critically important for students using modules of instructional material to be advised of the objective(s) of the unit.	T F D	T F D
23. Open space, uncluttered pages and the use of graphics and illustrations are important to students using individualized instructional units.	T F D	T F D
24. Because students progress at their own rate when using instructional materials in a competency-based instructional program, it is important for them to have opportunities to perform tasks and to respond to instruction within the materials.	T F D	T F D
25. Modular instructional units contribute to the ease of students dropping in and out of instruction.	T F D	T F D
26. Whenever possible, educators should purchase commercial instructional units rather than develop their own.	T F D	T F D
27. It is very difficult, unless you have access to sophisticated printing facilities, to vary the size and style of type used in various parts of an instructional unit.	T F D	T F D
28. Before one begins an instructional unit it is critical that the person is committed to a specific format and design of the unit.	T F D	T F D
29. It is essential that a writer of instructional units have the instructional goal and objective(s) well in mind.	T F D	T F D
30. Writers of instructional units should evaluate their writing level periodically while they are developing the content of the unit.	T F D	T F D
31. Records of pretest and post-test scores of students are very useful to the teacher if there is any question of his or her teaching ability.	T F D	T F D
32. In general, use of many instructional modules in an individualized program of instruction reduces the teacher's work load.	T F D	T F D
33. If there is a series of instructional modules developed for a course or program, there should be a similar, identifiable style, format and procedure used in the entire series.	T F D	T F D

34.	One of the major benefits of modular units of instruction is that this methodology permits students to know how well they are doing continually.	T	F	D	T	F	D
35.	Materials that you develop are your property and may be placed under copyright in your own name.	T	F	D	T	F	D
36.	As teachers have been developing more and more instructional units in the past few years, there have been very few problems with plagiarism or copyright violation.	T	F	D	T	F	D
37.	The only function of colored paper as it is used within instructional units is to brighten up the unit.	T	F	D	T	F	D
38.	The use of individualized, competency-based instruction causes everyone to be accountable: the student, the teacher and the school administrator.	T	F	D	T	F	D
39.	Management of the small instructional units poses few problems for the teacher.	T	F	D	T	F	D
40.	It is virtually impossible to modify traditional text material so it can be used in a modular, flexible instructional setting.	T	F	D	T	F	D
41.	Use of adult and student aides is common in individualized instruction programs.	T	F	D	T	F	D
42.	It is quite easy to find illustrations and graphics that, with a bit of modification, work well within instructional units.	T	F	D	T	F	D
43.	Because of the modularization of instruction, it is an easy task to keep track of student progress in an instructional laboratory.	T	F	D	T	F	D
44.	Use of ethnic names, illustrations of persons of various races and references to urban, suburban and rural scenes should be used in locally developed instructional materials.	T	F	D	T	F	D
45.	School agencies can be expected to continue to write and produce instructional materials.	T	F	D	T	F	D
46.	Locally developed instructional units are often exercise units rather than instructional units.	T	F	D	T	F	D
47.	Before one begins to write an instructional unit for use in his or her district, it is wise to determine ownership, bylines, instructional credit lines and so forth, in order to avoid misunderstanding.	T	F	D	T	F	D
48.	If a student "tests out" of a unit, he or she should be excused from the unit but not given school credit.	T	F	D	T	F	D
49.	Because students are studying independently on individualized materials, it is necessary for writers to build teaching/learning methodology right into the material.	T	F	D	T	F	D
50.	Grades (A, B, C, D, F) are of much less significance in competency-based instruction than they are in traditional instruction.	T	F	D	T	F	D

Answers to quiz at the very end of the book.

(When you take the post-test, fold back the pretest answers so they do not influence your post-test decisions.)

EVALUATING INSTRUCTION

Each of us tries to improve our procedures and skills as instructors. If we find with an instructional unit we've developed that our pretest/post-test scores reveal little student gain, it is hoped that we will look to our instructional materials and procedures and make modifications. We do not need to wonder if students are learning or not—we know for certain. Student performance on pretests and post-tests can guide us and we can set about finding better ways to teach.

The pretest, being administered at the start of the course or unit, provides students with a brief overview of the content of the unit. The questions in the test can excite their interest. The questions also can provide students with evidence that the unit does contain important information that they do not yet know. This forewarning alerts them to the need for careful study. The post-test, given at the end of the unit, serves as a valuable review of what has been covered.

WRITING AT SPECIFIED READING LEVELS

It is not uncommon to find that students in our classes have problems in reading. Because of this it is important that locally prepared instructional units be written at a level that closely matches students' reading ability. Writing at a predetermined level is not difficult if you will evaluate your writing and adjust it to the students' needs.

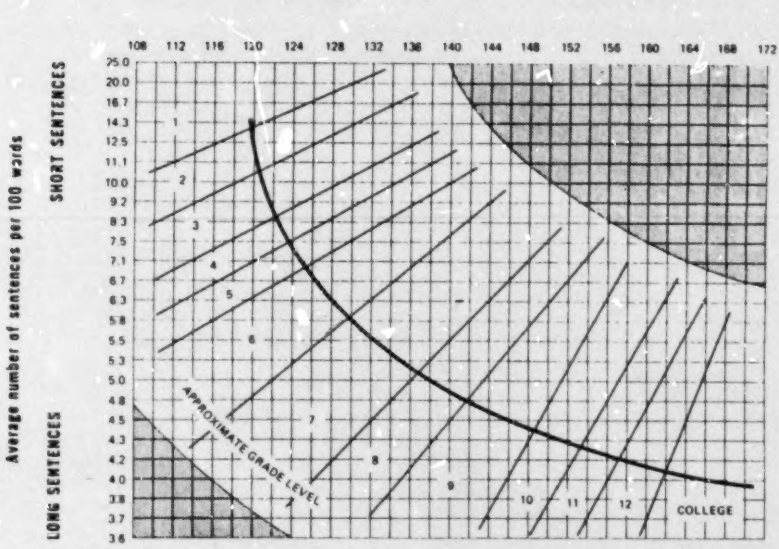
The reading level analysis system shown here is a valuable and reliable tool to have and to use. While it is impossible to develop instructional materials that meet the needs of every individual student, it is possible to write the units at a controlled level that will meet the needs of a larger student population. Frequently we do not have access to exact information about each of our student's reading level. Yet an instructor generally has a feeling of the "average" reading ability of students who enroll in his or her program. If in doubt, it is safer to prepare materials that are at a lower reading level rather than at a level above the students' ability.

Evaluating Your Writing Level

Take a sample of instructional material that you have prepared for student use. Count 100 words. You will use this sample to evaluate the level at which you write. Count the number of sentences within the sample. Next count the syllables. This is easily done if you slowly read the sample to yourself sounding out each syllable as you read. As you say each syllable, make a mark on a sheet of paper. These can be tallied in groups of five to make your final count easier. Then plot the number of sentences and the number of syllables on the graph shown here. The point where the lines meet will indicate the reading level of your sample. If you have written a unit of several pages, you should evaluate the writing level at several points within the unit.

Graph For Estimating Readability

by Edward Fry, Rutgers University Reading Center, New Jersey



DIRECTIONS: Randomly select three 100-word passages from a book or an article. Plot average number of syllables and average number of sentences per 100 words on graph to determine the grade level of the material. Choose more passages per book if great variability is observed and conclude that the book has uneven readability. Few books will fall in gray area, but when they do, grade level scores are invalid.

		SYLLABLES	SENTENCES
EXAMPLE:	1st Hundred Words	124	6.6
	2nd Hundred Words	141	5.5
	3rd Hundred Words	158	6.8
	Average	141	6.3

READABILITY 7TH GRADE (one dot plotted on graph)

(USED WITH PERMISSION OF *School Libraries*.)

Adjusting Your Writing Level

After analyzing several samplings of material that you have written for student use, you will have an idea of the approximate level at which you write. Generally it will be at a relatively high level—grade level 10 to 14 is not uncommon. You can reduce the level of your writing by substituting short, one-syllable words for complex ones. For example, if you used the word

"automobile" in your material, you could substitute the word "car." This would replace a four-syllable word with a one-syllable word—and it would reduce the reading level.

Experiment with your writing. The more sentences you have in your hundred-word sample, the lower the reading level will score on the graph. Replace compound and complex sentences with simple, short sentences. Replace words that have several syllables with easier, one-syllable synonyms whenever possible.

PROMOTING SUCCESS

With any instructional materials you produce, you should keep in mind that you may be asking a student to progress through the materials individually. This places a tremendous responsibility on those who write the instruction. Not only are you responsible for designing materials that will hold a student's interest, you must also build in the "pat on the back" that you will not be there to deliver. The same psychology of learning that would be used if teaching the student in person should be incorporated. After all, a major criterion for our instruction is whether we are causing students to succeed.

INSTRUCTIONAL CONTENT STANDARDS

To assure that the content of instructional units that are produced is acceptable, it is wise to adopt a list of content standards. Each person working on an instructional unit should observe whatever standards are adopted. The items listed here are ones that you should consider—whether you are writing a single unit or are responsible for developing an entire series of units.

1. Develop a clearly defined (written) goal before you begin writing.
2. Before you begin writing, have a clearly defined (written) performance objective that your students will be expected to meet.
3. Prepare a sequential topic outline before you begin writing. Include in your outline the activities that students will be required to perform.
4. Set production goals for your writing.
5. Be certain that the contents of the unit *instruct*. (Don't just provide "exercises.")
6. Include references to city, urban and rural settings in your writing and illustrations.
7. Use a balance of ethnic names in verbal illustrations.
8. Use white, black, Oriental and Hispanic persons in illustrations.
9. Do not perpetuate sex stereotyped roles, either through the illustrations or the written content.
10. Direct your material to a predetermined reading level.
11. Use a "you" approach in your writing to make it personal.
12. Design your material so it is motivational and encourages students to succeed.
13. Underline each new term that might not be understood by your readers. Define such terms in the following sentence.

14. Provide as many opportunities as is reasonable for students to participate in activities.
15. Provide a system for students to evaluate themselves.
16. Use illustrations and examples that relate to specific situations that students might encounter on future jobs.
17. Have some units make reference to a handicapped worker.

Referring to sex stereotyping can help you or your writing team to remember to use examples of individuals filling nontraditional jobs. For example, there should be female managers. There should be males doing filing, typing and so on. Females should be portrayed working as police officers and welders and filling other traditionally male work roles. By referring to handicapped workers, you help students who study from the units you produce to begin to accustom themselves to a world where everyone has a right to work at jobs that each can do—in spite of some sort of handicap.

By the same token, it is important to reflect our multiethnic society. Establishing a standard that ethnic names will be used and that illustrations will portray people of differing ethnic origins will help your students to see the world as it is. These references should show that society is made up of many kinds of people with many kinds of backgrounds, heritages, strengths and weaknesses.

The list of content standards that has been given is not complete, nor is it applicable in every setting. Yet it can serve as a starting point for you and your institution to develop your own list of standards. Your standards should serve as guides to your writers and as benchmarks for the evaluation of materials that are produced by local school agencies.

References

Fry, Edward. A Readability Graph for Librarians, Part I, *School Librarians,* Fall, 1969, 13-18.

Part V
DEVELOPING THE FORMAT

The format that you decide to use in presenting your materials will determine to a great extent how professional your materials appear and how functional they will be. Materials that are sloppy or inconsistent in format quickly reduce the credibility of the contents. Materials that are neat, consistent in format and well illustrated appear professional and easy to use.

ART WORK AND GRAPHICS

There are many ways that the writer can brighten up the page and give added emphasis to various points. While the body of the unit may be typed with line-and-a-half spacing, certain sections might be typed with single spacing and enclosed in a heavily lined box to give emphasis to that particular point. If there are several brief points that the writer wishes to emphasize, they can be listed, numbered and outlined with heavy lines.

1. VARY THE TYPING STYLE
2. USE GRAPHICS FOR EMPHASIS
3. LIST MAJOR POINTS

Variety and Style

There are many inexpensive aids available for improving the appearance of the typed page. For example, you can use rub-on letters (generally called "press type" or "dry transfer lettering") to produce surprisingly professional-looking printing. There are dozens of sizes and styles of press type available at most stationery supply stores. Included here are a few samples of these handy, easy-to-use letters.

You do not have to be an artist to add meaningful, professional-looking graphics to any instructional unit that you produce. Use a ruler and a felt-tipped pen and draw boxes around selected units. For example, you might draw a ⅛-inch-wide line, in a box form, around each set of directions in the unit you develop. Using these same tools, you might draw a double lined

box around other repetitive segments in the unit—section or part numbers, for example.

You can vary this system by drawing the boxes with broken lines: such as ¼-inch dashes with ⅛-inch blanks in between. Use of the boxes breaks up the page. The boxes also help students to identify part numbers, directions, student activities and so forth. They can help to break up the page from one of solid typing to one that is attractive, obviously well-organized and well-designed.

Simply typing some sections of the instructional unit in capital letters can help provide a change of style which, besides providing a refreshing contrast for the students, will help you to spotlight a particular kind of content within the unit—perhaps questions that follow each of the sub-units.

Even though you use no illustrations in the units that you prepare, graphics such as lines, boxes, stars, check marks and so forth help to break up the page. They separate the copy into identifiable units. They help to change the page from one of solid typing to one which is obviously organized and easy to read.

YOU FILL OUT A SALES CHECK

JOB NO. 4

SPECIAL DIRECTIONS: Using your pencil or pen, fill in the sales check below. Use the information that is in the box at the right.

Things to check:
- *Your penmanship--write so that it can be read
- *Accuracy--write exactly what you are supposed to write. Check your work.
- *Computations--check your math.
- *Verify your work--Use the key on page
- *Fill in the Self-Evaluation on page

OAKLAND ENTERPRISES
3763 IRELAND STREET
OAKLAND, CALIF. 94606

Date _____ 19___

Name _____

Address _____

CASH	C.O.D.	CHARGE	ON ACCT.	MDSE. RTD.	PAID OUT

CLERK	DESCRIPTION	PRICE	AMOUNT

Using Cut-Outs

You can easily develop attractive line drawings and cartoon characters for the units you prepare. You can find dozens of usable illustrations, which you can clip out, paste onto your finished, typewritten master copy and reproduce. They will make a world of difference in the appearance of the finished product.

Just watch for graphics and cartooned illustrations in the *noncopyrighted* sales sheets that are delivered to your home. Watch the bulk mailing items that you receive—on insurance, vacation homes, investments, appliances and so forth. You will find artistically designed arrows, stars, dollar signs and other symbols that are very usable as illustrations in the instructional material that you produce. Be sure, however, that you take such illustrations from noncopyrighted sources.

Modifying Cartoons

Frequently the cartoons you find that you might use in an instructional unit are not just exactly what you want. However, you will find that they often are easy to modify and to make into usable illustrations. All it takes is a bit of insight, typewriting correction fluid and a marking pen.

Here, for example, is a locally developed cartoon that was used in a school publication. It was included in an instructional unit on figuring discounts. By clipping off the man and whiting out the radio with correction fluid the young lady was left.

With the drawing of a pan and a bottle, this cartoon now is usable as an illustration in a unit on cooking.

In the next illustration, the same cartoon character was used again. This time her left arm was repositioned, and more of her body was drawn in. The same basic cartoon was used to give us a young lady nailing a railing together.

In the final use of this basic art work, the sweater was whited out with correction fluid. A blouse was drawn in. The cartoon character's right arm was cut off and glued into a new position. The left arm was cut completely off. Again, more of her body was added to the basic art work.

The original cartoon was done by a highly proficient commercial artist. The adjusted versions, while they may not be of such high quality, are functional in an instructional packet. You can, by taking a bit of time, modify cartoons in this same way and to have attractive, meaningful illustrations to use in your instructional units.

Here is another example of this same system for modifying a cartoon. The original cartoon was used in a district-produced instructional unit on the cost of borrowing money. Notice how the cartoon character is modified and made to fit in another setting. In the first modified example he is carrying a sign. This advises students to check their answers. It is true that space would be saved to handle this instruction by simply typing the words. However, use of a cartoon character such as this does brighten the page and it helps to break up the typing.

The same cartoon was used again to make another illustration. In this case, the sweater was whited out with typing correction fluid, a shirt was drawn in with a marking pen and a microphone was added along with notes to indicate singing. Most of us would have a difficult time drawing this illustration in its entirety. Yet, by using the basic, original art work (the face and the body proportions) we can modify it so it becomes usable.

DESIGNING A FORMAT

The format and design of the instructional unit must be carefully planned so that the final product is attractive and functional. This can be accomplished only by setting standards.

For example, working with the designers of the system, you can decide that all units will be developed with at least one illustration, major graphic or student activity on each manuscript page. Or you can decide that a specified size of type will be used for each level of headings. By specifying the width of the top, bottom and side margins of the pages, you can be assured that the pages will appear uncrowded and attractive to your students.

Most often locally prepared materials are produced from typewritten copy. In such cases the writers can be directed to prepare their manuscripts with their typewriters set for line-and-a-half spacing. Single-spaced typing appears crowded and is difficult to read. Double-spaced typing generally wastes too much space. Leaving one-half blank line between each typewritten line is cost-effective, easy to read and results in an attractive page.

If a single-element typewriter is used (a typewriter with a removable type head), a sharp, bold style of type should be selected. If there are several writers producing various units that are part of a set, each should follow the same format rules. Each should use the same production standards.

Suggested Standards

The following are examples of standards that might be used for producing instructional materials:

1. Type on an IBM 12 pitch (12 spaces-per-inch) typewriter.
2. Set the carriage return ratchet for line-and-a-half spacing.
3. Use a five-space indention for paragraphs.
4. Have one-inch left and right margins with a one-inch top margin. The bottom margin should be ¾ inch. The writing line should be 6½ inches long.
5. Leave one inch of space for unit headings (level 1 headings).
6. Leave ¾ inch space for level 2 headings.
7. Leave ½ inch space for level 3 headings.
8. Leave blank the *exact* space required for graphics and illustrations.
9. Plan on at least one illustration, major graphic or student activity on each page of copy.
10. Number pages in the center of the bottom margin.

PRODUCTION RESPONSIBILITIES

Writers should be provided with samples of the format system. It is their job to prepare their manuscript so space is left for headings and illustrations to be placed on the final copy without difficulty. Further, the final copy that the writers submit should not be the one used for making the reproduction masters. If the writers follow directions carefully, their pages are exact

guides for a clerical typist to use. This employee can prepare the final copy on which the graphics and headings can be glued into place.

It is not efficient to have the writer type the final, perfect copy. The writer should be held accountable for following the format design and for having punctuation, spelling and sentence structure in perfect order. The writer is responsible for defining terms, for structuring the content, for deciding which illustrations to use and so forth. In doing this exacting and demanding work the writer frequently will need to make typewritten corrections on the manuscript page. These pages should have the exact structure that is required. The final page, however, should be typed by a typist. Headings and art work should then be pasted into place. This final copy, after careful proofreading, is ready for reproduction.

PACKAGING THE MATERIALS

The way your materials are "packaged" can greatly enhance or detract from the instructional content. Should you decide, for instance, to reproduce your materials on colored paper, it can not only brighten up the instructional content, but also can serve as a coding system.

For example, all pretests (in a series of units) can be reproduced on green paper. The body of the unit can be on white, and post-tests can be on yellow paper. If you include an answer sheet, it can be on blue paper. If the instructional unit contains pages at the end on which students are to write responses, these pages can be salmon-colored. Once your students get used to the color-coding system they can flip quickly and effortlessly to various sections of each unit without waste of time or motion.

Cover Pages Should Identify

In most individualized instruction programs students are responsible for helping to make the program work. They must accept the responsibility for selecting and working through the units that make up the program of instruction. Thus, it is important that the system be designed for ease of use.

Coding and Numbering Units

In a marketing program that is operated through the use of many individualized learning units there might be a number of modules that deal with cashiering: operation of the cash register, making change, handling checks, dealing with customers and so on. This series of cashiering units could be coded with the letter *C*. Each unit should be assigned a number. The unit on making change, for example, might be numbered *C-2*. Such a system makes it easier for the students to select the correct unit and easier for the teacher to manage instruction.

The entire marketing program might be made up of 100 or more units. Each grouping, or cluster of related topics, is assigned a letter code and a unit number. This coding system is easy to operate, is specific and is helpful to both students and instructors.

Some schools have their stock of instructional materials arranged in tub files. Because these files are open at the top, it is easy to flip through the

tabbed folders to secure any needed item. Other schools choose to use open shelving for storing their materials. The modules are arranged in order, by clusters. Generally the unit title and code number appear on the shelf edge below each stack of materials.

Cover Formats

To provide additional aid to students and staff members, it is helpful if the cover format of related units is similar. When there are many, many units within an instructional program, managing the units frequently is difficult. All units in the cashiering segment of the marketing program could, for example, have a drawing or an outline of a cash register in the center of the cover page. Module titles, such as "Making Change," can be printed in bold print across the top of the cover page. The code for each unit, such as *C-2,* can be printed in bold print in the upper right hand corner of each unit. Students and staff members can quickly locate units they are seeking by using identifying graphics and code systems. Using this example, the outline of the cash register on a cover would provide quick and positive identification that the unit is a part of the series on cashiering.

Teacher Guide and Key

The designer and writer of the materials may be familiar with points on which students will have problems or questions. There may be points within the instructional unit where students are told to check with their instructor before progressing. The particular points that the teacher should check can be included in the teacher guide for the unit. Of course, it will be necessary to provide the answers to the pretest and post-tests. There keys should be included.

The teacher guide and key may be a single page in length or it may be several pages. It provides special guidance, suggestions and cautions to the teachers who are assigned to administer and manage the instructional unit.

Some producers of instructional units develop the units so that students' response pages are bound separately. This system makes it possible to use the instructional content section several times. It is nonconsumable. In such cases, the pretest is bound within the consumable student response pages section of the unit.

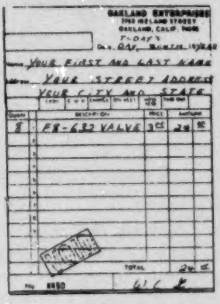
Student Answer Key

A growing number of producers of individualized instructional units are providing answer keys within the student materials. These serve to guide students and to assure them that they are doing the activities in the unit correctly. Since students do work independently and at their own pace, it is recognized that they need this security. While providing unit answer keys in a file drawer or on a tackboard in the classroom is of some help, it does not give students who are studying outside the classroom the assistance they need when they need it.

ANSWER KEY

JOB 1, 2, 3, 4. These are reading/study JOBS. Remember, YOU are to evaluate your work throughout this unit. How well did you read and study in JOBS 1, 2, 3, 4?

JOB 4. Your work should look like the illustration at the right. Check carefully. If you filled in the Sales Check differently, try to figure out why. Your teacher will help you evaluate JOB 4 if you have any difficulty.



JOB 5. There were three parts to this job: clipping out the Sales Checks, printing your name on each check, and putting the Sales Checks into correct order. Did you do all three JOBS?

JOB 6. You should have found 21 sales for OAKLAND and 21 "OTHER SALES." Check to make sure you have the right amounts in the right columns.

OAKLAND SALES	OTHER SALES
8.75	12.60
19.00	10.30
5.10	30.00

JOB 7. Adding a long column of figures takes skill and care. Your totals

BEST COPY AVAILABLE

Part VI

RECORD-KEEPING AND MANAGEMENT

Since one of the major features of individualized instruction is allowing students to progress at their own best rate, it is imperative that an instructional unit be available when a student needs it. Because there are so many different publications located in a vocational instructional laboratory, it is not unusual to find that one or more units are "out of stock" and students must wait until they are reproduced and made available.

INVENTORY CONTROL

In order to avoid such situations, you can operate a running inventory of materials. A form, such as the one shown here, must be designed and posted beside the materials stock. The name and code number of each unit is written in and the original inventory is added. As students and staff members take various units from stock, they adjust the inventory in the right-hand columns.

A staff member will make a periodic check on the status of the inventory. Any items that are at or near the reorder level will be reordered. This is a simple, functional system to operate, assuming that everyone who takes materials from stock records the adjusted inventory. Use of this system can prevent running out of various instructional units.

INVENTORY OF MATERIALS

TITLE OF UNIT, AND CODE		Orig. Invent.	Re-order Level	ADJUSTED INVENTORY					
CODE	TITLE								
C-1	Operation of the Cash Register	32	10	~~31~~	~~29~~	~~28~~	~~26~~	25	
C-2	Making Change	30	10	~~29~~	~~28~~	27			
C-3	Handling Checks	30	10	~~29~~	~~27~~	~~26~~	25		

STUDENTS' RECORDS

Students want and need to know just where they are in a training program. For this reason, they should be provided with a form that makes it easy for them to record the units that they have completed. This form may be filed in a student folder that is kept in the classroom or it may be carried with the student. While many different forms may be devised, the one shown here contains the basic information that is needed.

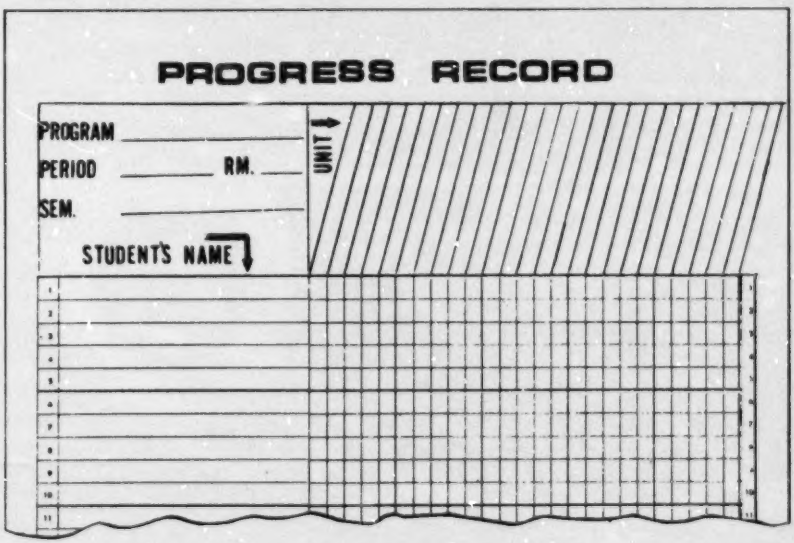
Student_____ Program _____

Starting Date _____

Instructional Unit	Code	Date Started	Date Completed	Inst. OK

INSTRUCTOR'S RECORDS

With many students progressing through many units on an individualized basis, it is critically important that the instructor have a record system that keeps track of each student's progress. The one illustrated here is an example of how a form may be constructed to make record-keeping easy.



Tackboard Record

A copy of the class progress form should be posted in the classroom on the tackboard. As each student completes a unit he or she is responsible to check off the item. This provides the instructor and aides with an easy-to-use inventory of student progress. Because many students are embarassed to

have their names appear on such a record form (for everyone to see), you may assign student code numbers. In this way the student who is not progressing rapidly can avoid the embarrassment of having other students aware of his or her slower pace.

One interesting alternative to this system has been used by some teachers. Class progress records can be posted on the back side of cupboard doors. One door is used for period one, another for period two and so forth. This system tends to keep information on each of the progress sheets restricted to students within a single classroom.

Teacher Records

A duplicate of the class progress form can be prepared and punched for a three-ring binder. This is the record sheet on which the teacher and the aides record grades, confidential notations for grading recommendations and other administrative records. As units are completed by students, pretest scores, post-test scores and other progress marks can be recorded.

Record on Instructional Units

In a large individualized instruction laboratory some instructors wish to have a record of which students took each of the units and how well they succeeded. They will record pretest scores, post-test scores, and the time taken to complete the unit. Such records are kept primarily to evaluate the instructional units themselves. While they do take a bit of time to keep, they are an invaluable source of information about the various units.

STUDENT	TIME TO COMPLETE	TEST SCORES		
		PRETEST	POSTTEST	ALTERNATE POSTTEST
JIM JIMINEZ	6 HRS.	12 RIGHT	27 RIGHT	—
JOE COHEN	7 HRS.	8 RIGHT	19 RIGHT	23 RIGHT
MARY BEASLEY	9 HRS.	7 RIGHT	29 RIGHT	—
TIMMY MITCHEL	4 HRS.	10 RIGHT	26 RIGHT	—
MARCY BARDVICH	—	28 RIGHT	—	—

For example, you might quickly spot that on a particular unit all students score very high on the pretest. This might cause you to redesign the pretest—or even eliminate the unit. If there is consistent evidence of very little gain between pretest and post-test scores, you may be alerted to the need to evaluate the unit. The testing may be too difficult. Or perhaps the unit does not teach what it is intended to teach.

STUDENT CERTIFICATION

In most individualized programs of instruction, particularly those that are developed around performance objectives, students are certified as proficient by the instructor. Usually a formal document is used. The front side of the certificate names the instructional program, the school district or educational agency and indicates that the named student is proficient in those instructional modules that are listed and initialed on the reverse side of the certificate. The face of the certificate has a place for the instructor and the chief school administrator to sign.

The modules that make up the program are listed on the reverse side of the document. The instructor initials each module as the student passes the respective proficiency examinations. School systems that use such a certification system report that it is gratefully received by business and industry. By referring to the listing of proficiencies potential employers can see exactly what a student can *do*. This is far more helpful than simply being advised of the letter grade that a student was assigned in a vocational program.

PRETEST/POST-TEST KEY

1. F	14. F	27. F	40. F
2. F	15. F	28. T	41. T
3. T	16. T	29. T	42. T
4. T	17. T	30. T	43. F
5. F	18. F	31. T	44. T
6. F	19. T	32. F	45. T
7. F	20. T	33. T	46. T
8. T	21. T	34. T	47. T
9. F	22. T	35. T	48. F
10. F	23. T	36. F	49. T
11. T	24. T	37. F	50. T
12. F	25. T	38. T	
13. T	26. T	39. F	

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